Management of annual weeds in cereals
- recent advances in Denmark

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Mechanical weed control

Crop-weed ecology

Preventive cultural methods

Strategy
Preventive cultural methods

- crop rotation
- competitive crop cultivars
- sowing time
- manure placement
Crop rotations

- **Diversified choice of crops**
  - sowing time (autumn/spring)
  - duration (annual/several years)
  - harvest time (silage/maturity)
  - spatial arrangement (broadspread/row)
- **Nutrients**
- **Perennial crops "cleaning"**
Competitive crop cultivars
winter wheat

Relative weed biomass

- Yatch
- Lynx
- Haven
- Mixture
- Meridien
- Terra
- Pentium
- Cortez
- Flair

1998 1999
Choose a cereal variety which:

- is tall
- grows fast
- has large leaves

Help the cereal by:
- high seed rate
- seeds with high vitality
Sowing time and weed control in winter wheat

- Untreated
- Mechanical
- Chemical

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Oct. 1</th>
<th>Sept. 20</th>
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</thead>
<tbody>
<tr>
<td>Untreated</td>
<td></td>
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<tr>
<td>Mechanical</td>
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<tr>
<td>Chemical</td>
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</table>

weed biomass, g m$^{-2}$
Early sowing, weed harrowing

Late sowing, untreated
Yield of winter wheat at different sowing times

Yield, tons ha\(^{-1}\)

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<th></th>
<th>Sept. 20</th>
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<tbody>
<tr>
<td>Herbicide</td>
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<tr>
<td>Untreated</td>
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Sowing time of winter wheat:

- sow early if there is a low weed pressure
- sow late if the weed pressure is large
Placement of slurry

- Weed seeds
- Cereal seeds
- Slurry
Effect on weeds of placement of slurry and weed control

![Bar chart showing the effect of slurry placement on weeds]

- Untreated
- Weed harrowing
- Herbicide
- Relative weed biomass
- Broadspread Placement

The chart illustrates the relative weed biomass for different treatments, with untreated plots showing significantly higher weed biomass compared to those treated with herbicides or subjected to weed harrowing.
Growth of barley with (+) and without (-) slurry placement
Placement of slurry:

- **crop**
  - easier access to nutrients
  - bigger yield and
  - more competitive

- **weeds**
  - less access to the nutrients
  - less competitive
Mechanical weed control

- Weed harrowing in spring cereals
  - Pre-emergence
  - Post-emergence
  - Selective
- Row hoeing in winter cereals
- Weed control in cereals with underseed
Weed harrowing in spring cereals

Pre-emergence  Post-emergence  Selective
Effect of weed harrowing on *S. arvensis* at different weed stages

![Graph showing the effect of weed harrowing on *S. arvensis* at different weed stages with two curves indicating the weed control effect (%) in relation to crop soil cover (%). The green line represents 0-2 true leaves, while the purple line represents 2-4 true leaves.](image)
Effect of weed harrowing in spring barley

Effect on weeds, %

- Pre-emergence
- Pre- & post-emergence
- Pre-, post- and selective
Weed harrowing

• pre-emergence harrowing before the weeds develop true leaves
• post-emergence harrowing when the crop has two-three leaves
  - in case of very competitive weeds: better sooner than later!
• selective harrowing if needed
Effect of weed control and row distance in winter barley

![Graph showing the effect of weed control and row distance in winter barley. The x-axis represents row distance (12 cm and 24 cm), and the y-axis represents weed biomass (g m$^{-2}$). The graph compares two treatments: Control and Row hoeing + harrowing.]
Row hoeing in winter cereals

- If large row distance: always intensive mechanical control!
- Large row distance and row hoeing at high weed pressure
Effect of weed control on undersown ley in spring barley

![Graph showing the effect of weed control on grass and clover coverage in undersown ley in spring barley. The graph compares different methods of weed control: broadcasted, untreated; broadcasted, harrowing; special sowing, untreated; special sowing, harrowing; special sowing, hoeing. The grass coverage is shown in green, and the clover coverage in orange. The graph indicates varying degrees of coverage across the different methods.]
Weed control in cereals with undersown ley

- **Low weed pressure:**
  - normal row distance
  - no weed control

- **High weed pressure:**
  - large row distance
  - sow cereal and ley seeds in same row
  - weed harrowing and row hoeing
Strategy - winter wheat
Strategy - choice of cultivar
20 % less weeds
Strategy - delayed sowing
30% less weeds
Strategy - weed harrowing + hoeing
70% less weeds
Strategy - all methods
83% less weeds
Strategy - spring barley

variety - 20%
placement of slurry - 30%
weed harrowing - 80%
all methods - 88%
List of references

- ask me
- pick one up at my poster